



NASA Science Program Support Office



Annual Report



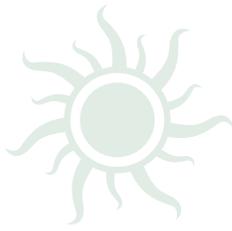
Delivering NASA Science Face-to-Face to the World



Overview

The Year at a Glance

International Symposium on Digital Earth	October 5–9, 2015—Halifax, Nova Scotia
Geological Society of America Annual Meeting	November 1–4, 2015—Baltimore, Maryland
American Astronomical Society Division for Planetary Sciences Annual Meeting	November 8–13, 2015—National Harbor, Maryland
Group on Earth Observations XII Plenary and Ministerial Summit	November 11–13, 2015—Mexico City, Mexico
21st Conference of Parties to the United Nations Framework Convention on Climate Change	November 30–December 11, 2015—Paris, France
American Geophysical Union Fall Meeting	December 14–18, 2015—San Francisco, California
American Astronomical Society Annual Meeting	January 4–8, 2016—Kissimmee, Florida
American Meteorological Society Annual Meeting	January 10–14, 2016—New Orleans, Louisiana
National Council for Science and the Environment National Conference	January 19–21, 2016—Washington, D.C.
American Association for the Advancement of Science Annual Meeting	February 11–15, 2016—Washington, D.C.
Ocean Sciences Meeting	February 21–26, 2016—New Orleans, Louisiana
USA Science and Engineering Festival	April 16–17, 2016—Washington, D.C.
European Geosciences Union General Assembly	April 17–22, 2016—Vienna, Austria
Earth Day at Union Station	April 21–22, 2016—Washington, D.C.
Maryland Library Association Annual Meeting	May 4–6, 2016—Ocean City, Maryland
Japan Geoscience Union Meeting	May 22–26, 2016—Chiba, Japan
NASA Science Day on the Hill	June 15, 2016—Washington, D.C.
Air & Waste Management Association Annual Meeting	June 20–23, 2016—New Orleans, Louisiana
American Library Association Annual Conference	June 23–28, 2016—Orlando, Florida
Asia Oceania Geosciences Society Annual Meeting	July 31–August 5, 2016—Beijing, China
American Chemical Society National Meeting and Exposition	August 21–25, 2016—Philadelphia, Pennsylvania
IUCN World Conservation Congress	September 1–10, 2016—Honolulu, Hawaii
Our Ocean Conference	September 15–16, 2016—Washington, D.C.
Geological Society of America Annual Meeting	September 25–28, 2016—Denver, Colorado
White House Arctic Science Ministerial	September 28, 2016—Washington, D.C.



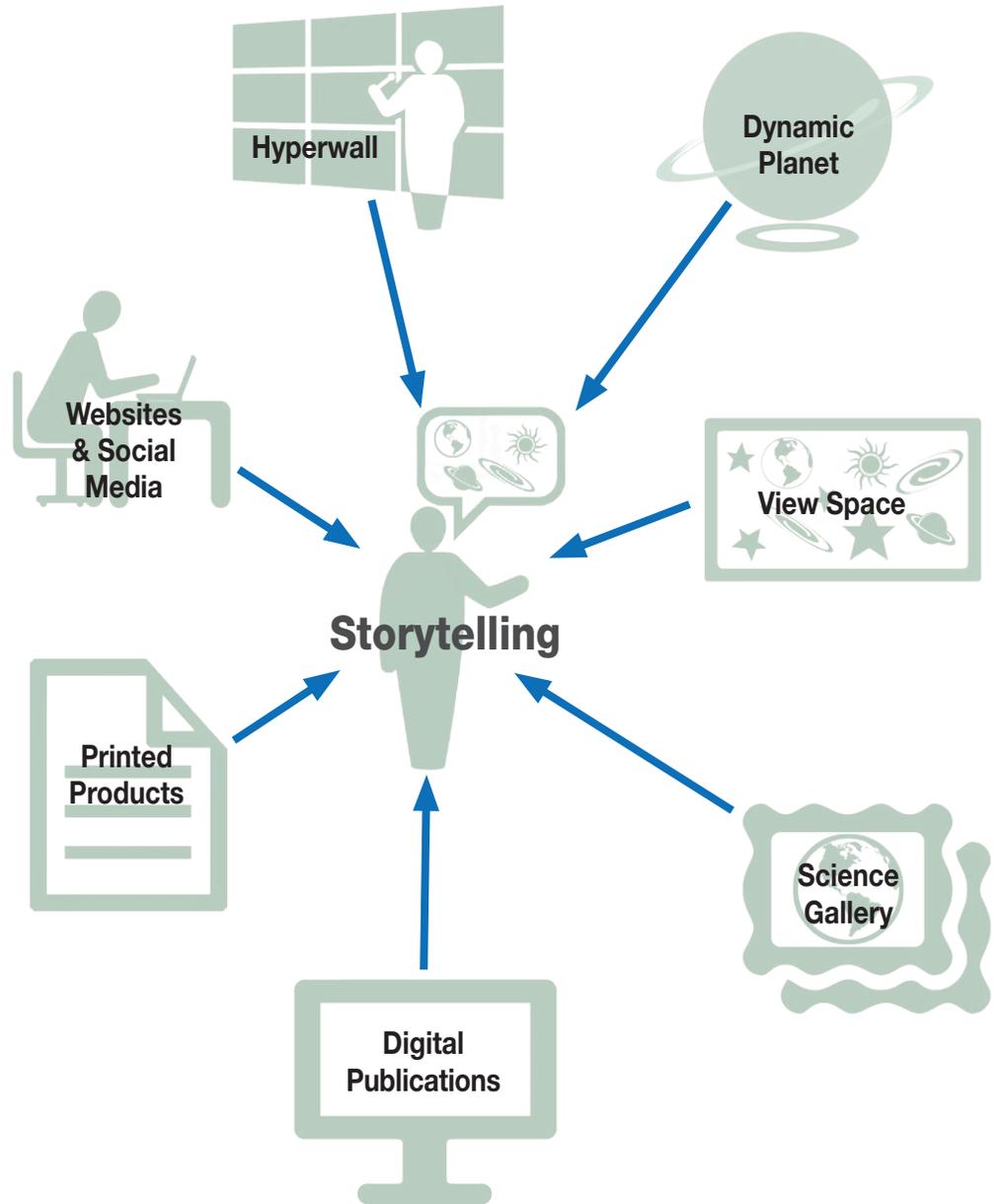
Our Mission

We are the primary point-of-contact for NASA's Science Mission Directorate and Earth Science Division for science exhibit outreach and product development.

Our Vision

The Science Program Support Office strives to provide an inspiring and interactive venue, using a unique storytelling approach, that allows a variety of audiences worldwide to connect with NASA Science, offering:

- opportunities for individuals to engage face-to-face with NASA scientists, engineers, modelers, and outreach personnel alike (e.g., via dynamic scientific presentations and demonstrations);
- access to free and accurate scientific information related to a variety of interesting NASA missions, research topics, and scientific discoveries (e.g., science story booklets, mission brochures, *The Earth Observer* newsletter); and
- unique visual scientific perspectives by way of stunning imagery and other creative multimedia content (e.g., Hyperwall, Dynamic Planet).

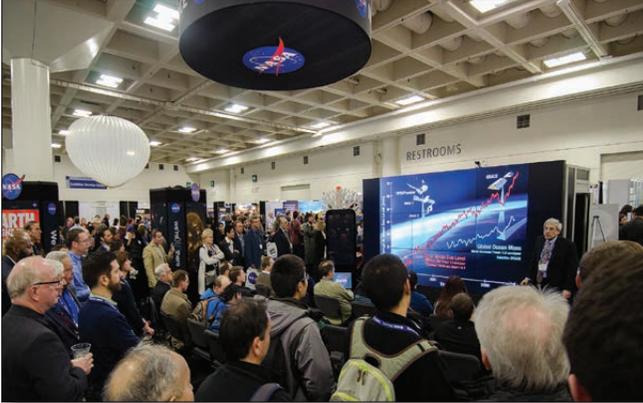




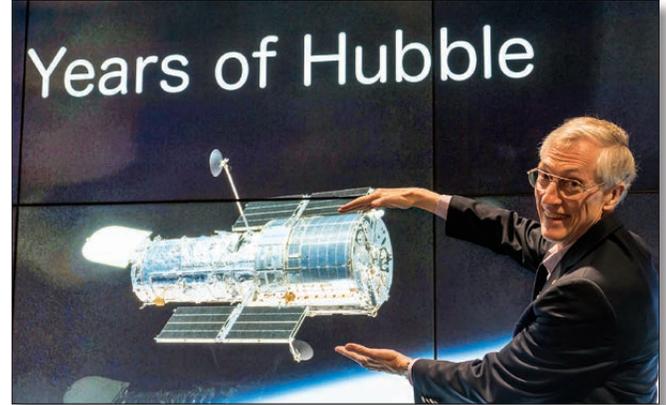
Highlights of 2016

For more photos from our events, visit our Flickr page at www.flickr.com/photos/eospso/sets.

Professional Scientific Conferences - Domestic



American Geophysical Union Fall Meeting
San Francisco, California



American Astronomical Society Annual Meeting
Kissimmee, Florida

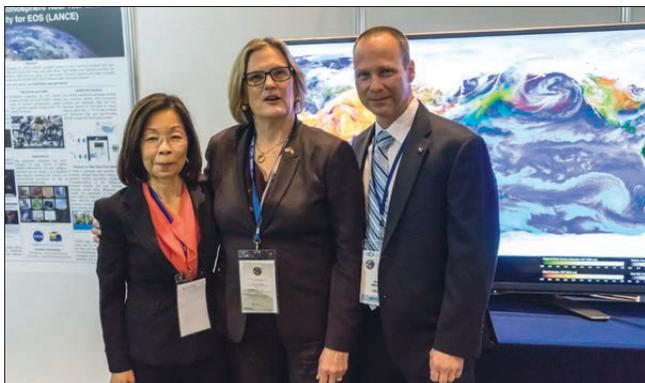
Professional Scientific Conferences - International



European Geosciences Union General Assembly
Vienna, Austria



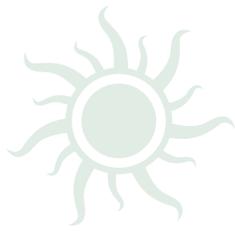
21st Conference of Parties to the United Nations Framework
Convention on Climate Change, Paris, France



Group on Earth Observations XII Plenary & Ministerial Summit
Mexico City, Mexico



Japan Geosciences Union Annual Meeting
Chiba, Japan



Congressional

Professional Organization



**NASA Science Day on the Hill
Washington, D.C.**



**American Library Association Annual Conference
Orlando, Florida**

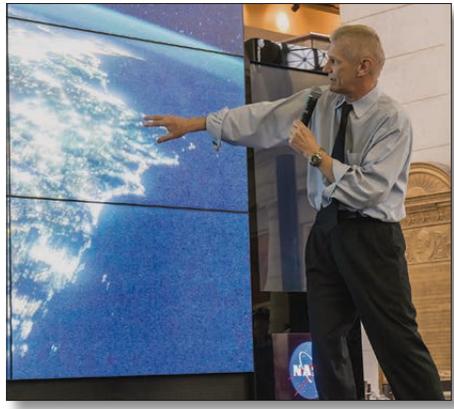
General Public Engagement



**American Association for the Advancement of Science
Annual Meeting, Washington, D.C.**



**USA Science and Engineering Festival
Washington, D.C.**



Earth Day at Union Station, Washington, D.C.



Hyperwall Stories

This list includes stories that were developed by our team for use on the Hyperwall and released between September 2015 and August 2016. For a more complete list of Hyperwall presentations, go to svs.gsfc.nasa.gov/hw. For news on the latest Hyperwall show releases, join the Hyperwall Content News listserve at go.nasa.gov/28MqpiG.

NASA Scatterometry Timeline

An infographic showing a timeline of NASA scatterometry instruments from 1973 to 2016.

svs.gsfc.nasa.gov/30789

Blue Marble 2015

This composite image from the Suomi National Polar-orbiting Partnership (NPP) spacecraft shows how Earth looked from space on October 14, 2015, when the contiguous United States had mostly clear skies.

svs.gsfc.nasa.gov/30763

Soil Moisture and Rainfall

This visualization compares SMAP weekly soil moisture and sea surface salinity data (over land and water, respectively) with IMERG precipitation data to show how precipitation impacts soil moisture and salinity.

svs.gsfc.nasa.gov/30698

Earth: A System of Systems

Composed of “slices” from eight different visualizations, this composite reveals that Earth’s system comprises diverse components that interact in complex ways.

svs.gsfc.nasa.gov/30701

Yearly Cycle of Earth’s Biosphere

This visualization shows the 12-month cycle of all plant life on Earth for land and ocean.

svs.gsfc.nasa.gov/30709

Singapore Smog

Visualizations showing air quality over Singapore on September 25 and May 25, 2015 using MODIS and CALIPSO data.

svs.gsfc.nasa.gov/30699

Ozonewatch 2015

This series shows the recent status of the ozone hole over the Antarctic.

svs.gsfc.nasa.gov/30731

Trio of Hurricanes Over the Pacific Ocean

Nighttime and daytime satellite images showing three Category 4 hurricanes crossing the Pacific Ocean in August 2015.

svs.gsfc.nasa.gov/30628

Sea Surface Height Anomaly

This visualization shows sea surface height anomalies from January 1, 2015 to January 22, 2016.

svs.gsfc.nasa.gov/30756

Sea Surface Temperature Anomaly Time Series

These maps, created using datasets produced by NOAA, show monthly sea surface temperature anomalies from February 2015 to February 2016.

svs.gsfc.nasa.gov/30753

Sea Surface Temperature and Temperature Anomaly 2015–2016

Sea surface temperature and sea surface temperature anomalies reveal the progression of the El Niño event from January 1, 2015 to January 2, 2016.

svs.gsfc.nasa.gov/30748

ENSO Sea Surface Temperature Anomalies: 2015–2016

Animation of sea surface temperature showing the evolution of the 2015–2016 El Niño–Southern Oscillation (ENSO) event.

svs.gsfc.nasa.gov/30645

Death by El Niño

These videos illustrate how El Niño’s warm waters can threaten marine life in the Pacific Ocean.

svs.gsfc.nasa.gov/12193

El Niño Watch 2015

Side-by-side comparisons of Pacific Ocean sea surface height anomalies in 1997 (TOPEX/Poseidon) and 2015 (OSTM/Jason-2).

svs.gsfc.nasa.gov/30629

Ocean Alkalinity

This visualization shows monthly surface total alkalinity from August 2011 to May 2015 as derived using data from NASA’s Aquarius mission.

svs.gsfc.nasa.gov/30697

2015 El Niño Disrupts Ocean Chlorophyll

Sea surface temperature anomaly and ocean color variations are compared for major El Niño (December 2015) and La Niña (December 1999) events.

svs.gsfc.nasa.gov/30747

RapidScat Observes El Niño

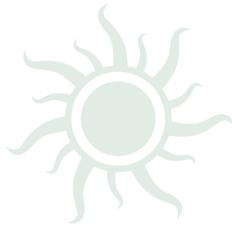
This image shows ocean winds near the surface as observed by NASA’s ISS-RapidScat on the International Space Station.

svs.gsfc.nasa.gov/30749

Ocean Color Time Series

This visualization shows monthly sea surface chlorophyll from July 2002 through February 2016.

svs.gsfc.nasa.gov/30754



El Niño Precipitation Anomaly

These visualizations of data from the GPM Constellation from July 1, 2015 to May 20, 2016, show how the 2015–16 El Niño shifted global rainfall patterns. svs.gsfc.nasa.gov/30766

All Stirred Up in the Arabian Sea

A Suomi NPP image of a phytoplankton bloom off the coasts of Oman, Pakistan, and India on December 21, 2015. svs.gsfc.nasa.gov/30745

NOAA Coral Reef Watch 2015

These visualizations show current global reef conditions identifying areas at risk for coral bleaching. svs.gsfc.nasa.gov/30728

OMG Maps Greenland Sea Floor Depth

This image shows a region off the coast of northwest Greenland mapped as part of the fall 2015 campaign of NASA's Oceans Melting Greenland (OMG) mission. svs.gsfc.nasa.gov/30767

Changes in Zachariae Isstrøm Glacier

This Landsat time-lapse animation shows the glacier's retreat during the 2015 melt season, from May 19 through October 1, 2015. svs.gsfc.nasa.gov/30750

Fires at Night in the U.S. Northwest

Daytime and nighttime satellite data images of wildfires in the Pacific Northwest in summer 2015. svs.gsfc.nasa.gov/30627

Southwestern Europe and Australia at Night 2014-2015

The Suomi NPP satellite observes Earth's lights at night from October 1, 2014 to April 30, 2015. svs.gsfc.nasa.gov/30693

Malaria Modeling and Transmission

These maps use satellite data combined with models of the mosquito life cycle to help predict where mosquitoes will live and breed. svs.gsfc.nasa.gov/30593

Reading the ABCs from Space

Twenty-six letters of the English alphabet, plus the “#” and “@” signs, are represented by NASA satellite imagery and astronaut photography. svs.gsfc.nasa.gov/30760

Our Solar System

This visualization shows the rotation and axial tilts of the solar system's eight planets, Pluto, and the sun. svs.gsfc.nasa.gov/30710

March 2016 Total Solar Eclipse

Images of the March 2016 total solar eclipse from the DSCOVR/EPIC and the Japanese Himawari-8 satellites. svs.gsfc.nasa.gov/30758

Dawn Images of Ceres

This collection of images shows various craters as observed by the Dawn spacecraft during its exploration of the dwarf planet Ceres. svs.gsfc.nasa.gov/30764

Rosetta Images of Comet 67P

Images from the Rosetta spacecraft show detailed features of Comet 67p/Churyumov-Gerasimenko. svs.gsfc.nasa.gov/30765

Pluto's "Badlands"

This high-resolution image from NASA's New Horizons spacecraft shows how erosion and faulting has sculpted this portion of Pluto's icy crust. svs.gsfc.nasa.gov/30737

Dawn Takes a Closer Look at Occator

This image, taken by NASA's Dawn spacecraft, shows the Occator crater on the dwarf planet Ceres. svs.gsfc.nasa.gov/30738

Io in Motion

This new base map of Jupiter's moon Io was produced by combining the best images from both the Voyager 1 and Galileo missions. svs.gsfc.nasa.gov/30706

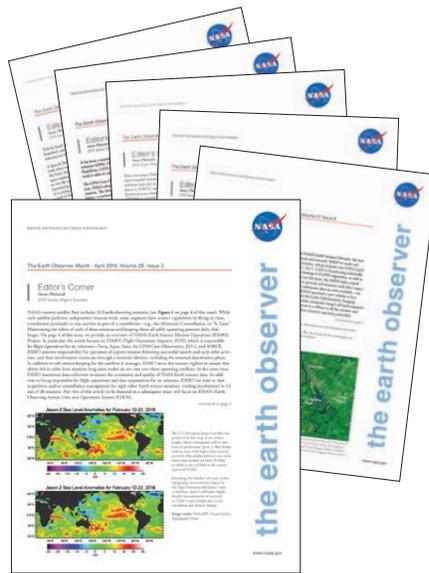
Jason-3 Begins Mapping the Ocean

This map shows sea surface height measurements from the first 10 days (February 12-20, 2016) of data collected once Jason-3 reached its operational orbit of 830 miles (1336 kilometers). svs.gsfc.nasa.gov/30762



The Earth Observer Newsletter

Now in its twenty-eighth year, *The Earth Observer* newsletter continues to report on the latest news from NASA's Earth Science program. During 2015–16, we reported on upcoming missions, including SAGE-III/ISS [Nov–Dec'15], and LIS on ISS [May–Jun'16], as well as milestones for current missions or programs: the fifteenth anniversary of EO-1 [Jan–Feb'16], and the tenth anniversary of CloudSat/CALIPSO [Jul–Aug'16]. We also had an article on Earth Science Mission Operations, Flight Operations [Mar–Apr'16] and coverage of NASA's participation at the AGU Fall Meeting, COP-21, and GEO-XII



[Jan–Feb'16], as well as Earth Day [May–Jun'16]. In addition to features, we continue our long tradition of reporting on relevant science meetings. Noteworthy in 2015–16 were the second GPM Applications Workshop [Sep–Oct'15] and the MODIS/VIIRS Science Team Meeting [Sep–Oct'15]. Each issue also includes an Editorial from the EOS Senior Project Scientist, several NASA Earth Science news stories, a Science in the News column, and Education Update; a Blog Log compiling the latest blogs relevant to Earth Science appears roughly quarterly.

Annotated Bibliography of Articles Authored or Co-Authored by Team Members [October 1, 2015–September 30, 2016]

Ward, Alan and Dalia Kirschbaum: "Measuring Rain and Snow for Science and Society: The Second GPM Applications Workshop," *The Earth Observer*, Sep–Oct 2015, **27:5**. This article summarizes the Second GPM Applications Workshop, which took place June 9–10, 2015 in Adelphi, MD.

Hilsenrath, Ernest: "Continuity Assured: The First Postlaunch MODIS–VIIRS Science Team Meeting," *The Earth Observer*, Sep–Oct 2015, **27:5**. The article summarizes the first combined MODIS–VIIRS Science Team Meeting, where the focus was on ensuring continuity of climate quality measurements from MODIS (EOS) to VIIRS (Suomi NPP and JPSS).

Hanson, Heather and Kristyn Damadeo: "SAGE III on ISS: Continuing the Data Record," *The Earth Observer*, Nov–Dec 2016, **27:6**. Article describes the upcoming SAGE III on ISS mission and how it continues the longterm record of limb ozone measurements acquired by previous SAGE instruments.

Landis, David, Mitch Hobish, *et. al.*: "EO-1: 15 Years After the Start of Its One-Year Mission," *The Earth Observer*, Jan–Feb 2016, **28:1**. Article written to commemorate the fifteenth anniversary of the launch of EO-1. The mission is scheduled to end in late 2016.

Hanson, Heather: "Delivering NASA Science Face-to-Face to the World," *The Earth Observer*, Jan–Feb 2016, **28:1**. Article discusses Science Mission Support Office's outreach activities in fall 2016. Focuses on GEO-XII, COP-21, and AGU meetings.

Hilsenrath, Ernest and Alan Ward: "Earth Science Mission Operations, Part I: Flight Operations—Orchestrating NASA's Fleet of Earth Observing Satellites," *The Earth Observer*, Mar–Apr 2016, **28:2**. Article describes ESMO's Flight Operations Segment (FOS).

Hanson, Heather: "NASA Celebrates Earth Day in the Nation's Capital," *The Earth Observer*, May–Jun 2016, **28:3**. Article describes NASA's Earth Day 2016 activities at Union Station including Hyperwall, hands-on activities, "Tree of Thoughts," and more.

Ellis, Todd and Alan Ward: "A Useful Pursuit of Shadows: CloudSat and CALIPSO Celebrate Ten Years of Observing Clouds and Aerosols," *The Earth Observer*, July–August 2016, **28:4**. Article reviews the CloudSat and CALIPSO missions and some of the noteworthy scientific achievements of their first decade in orbit.

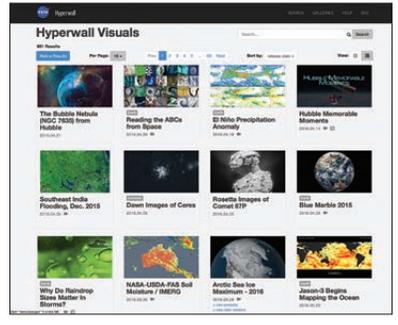
Other Publications, Social Media, and More!



Printed publications, eBooks, and *The Earth Observer* newsletter archive can be found online at eospspo.nasa.gov.



Hyperwall Online Catalog svs.gsfc.nasa.gov/hw



2016 NASA Science Calendar



Lenticular Products



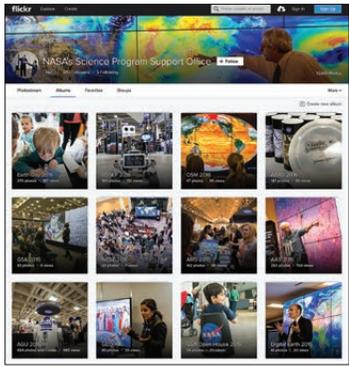
Event Support



Mission Support



 www.flickr.com/photos/eospspo/sets



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2016 Partnerships

Collaboration Within NASA

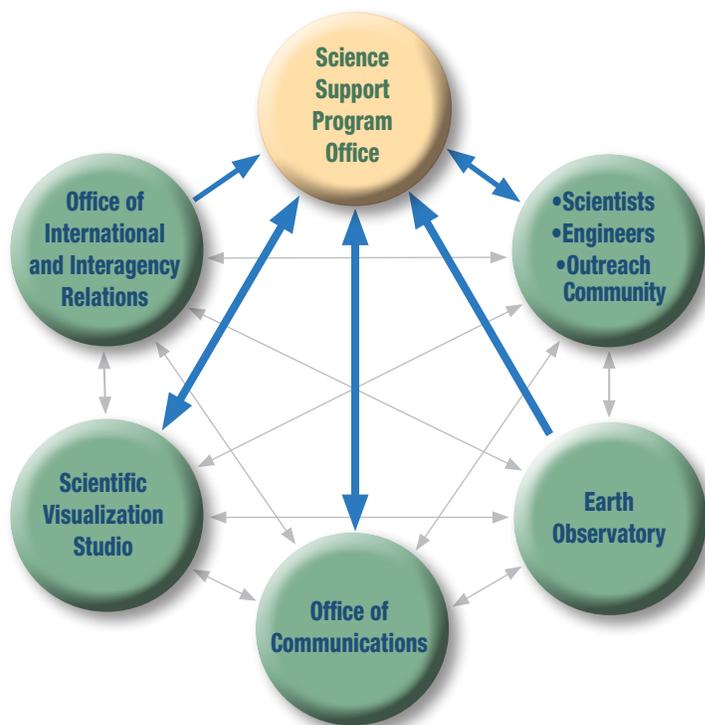


Over the years the office has established several ongoing working relationships across NASA's Science Mission Directorate (SMD) [see diagram at right]. These key partnerships allow the office to more effectively stay abreast of the latest science results, technology trends, and communication strategies (i.e., platforms).

For example, in 2016, the Science Program Support Office (SPSO) worked closely with NASA SMD management on the planning, coordination, and execution of NASA Science Day on the Hill, held June 15 in Washington, D.C. SPSO managed and oversaw coordination for the Hyperwall, a new

Dynamic Planet (4-foot diameter spherical display), and a set of custom Earth science graphics used as a backdrop. The SPSO organized Hyperwall playlists for several SMD senior-level managers, as well as subject matter experts from each division. Seven members of Congress attended the event

along with numerous congressional staffers. It is estimated that 500 attendees came to the event. Feedback about the event has been overwhelmingly positive—the best NASA outreach event on the Hill in recent years!



Collaboration Outside NASA



The office's extensive internal network and proven ability to bridge gaps across centers, missions, and programs provides the foundation and resource-base needed to strongly represent NASA at international and interagency venues. These events, along with several others, have helped to inspire and strengthen the agency's strategic partnerships. Key international and interagency partners include the United States Department of State, Japan Aerospace Exploration Agency, Group on Earth Observations, National Oceanic and Atmospheric Administration, Earth Day Network, Union Station, and various other universities and research institutions.

Conference Support



Hyperwall Content Development

NASA's Hyperwall continues to be among one of the most effective platforms used to communicate NASA Science by way of presentations given by scientists, guided docent tours, and stand-alone visuals accompanied by storytelling captions.

Our goal is to curate a collection of visualizations that explain NASA science. To do this, our Hyperwall team:

1. provides context to SVS content by adding storytelling captions;
2. finds and adds content from other centers/groups;

3. creates our own visualizations (to fill in gaps in topic coverage, to support events, or to respond in a timely manner to NASA news releases, etc.);
4. assembles playlists of visualizations on various topics; and
5. retires outdated content from active use.

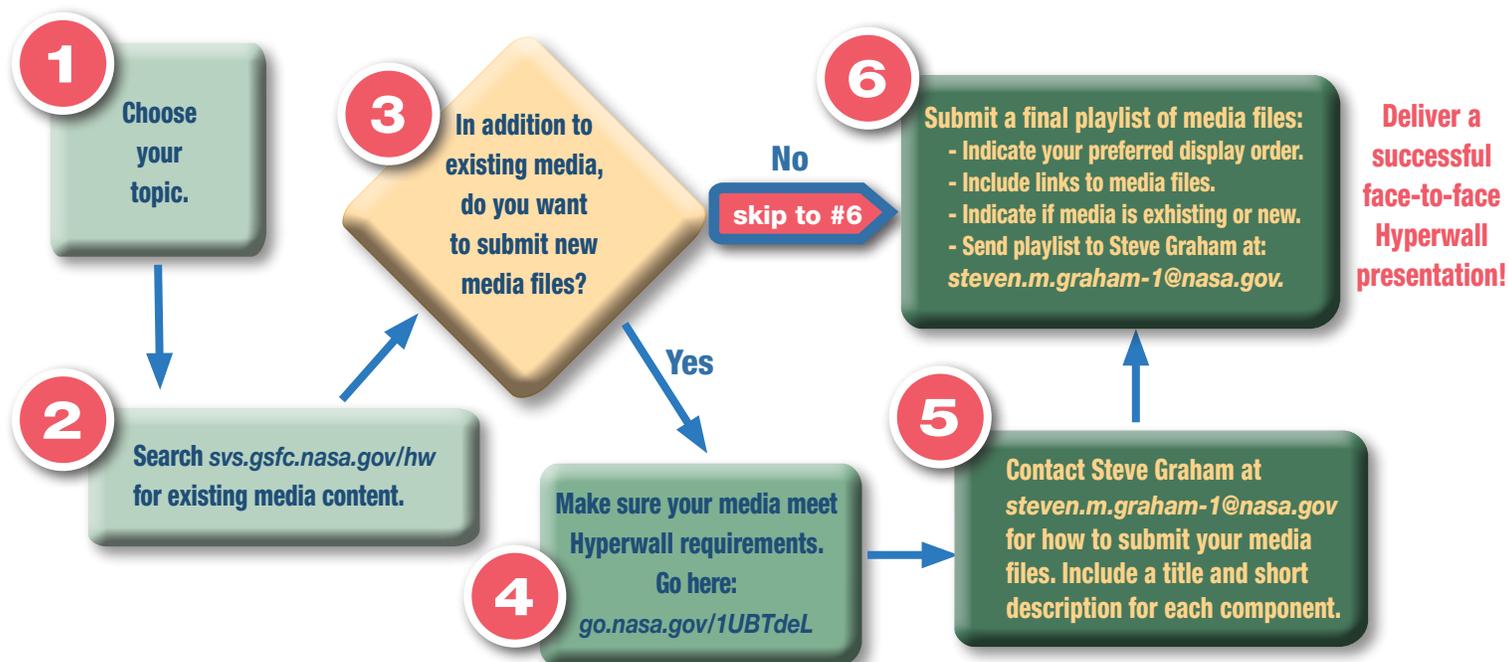
The office routinely works with program representatives, scientists, and outreach personnel to ensure a balanced portfolio of Hyperwall content to seamlessly communicate information about all the agency's programs and scientific discoveries.

New!

Speaker Support



6 Steps to Making Your Own Hyperwall Presentation





Who We Are

Then and Now

NASA's Science Program Support Office (SPSO) was established in 1989, around the time the Earth Observing System (EOS) program began. In an era when the Internet was not as ubiquitous, the outreach staff, which at the time was only two people, was a vital communications link for the fledgling EOS community.

In 1992, the office, then known as the EOS Project Science Office, coordinated and supported the first EOS exhibit at the American Geophysical Union (AGU) Fall Meeting, featuring a static pop-up exhibit used to display large satellite images (e.g., the first Blue Marble). Over time, new technologies have been incorporated into the exhibit such as computer and plasma screens, the Dynamic Planet (a spherical display), and most recently, the Hyperwall (a high-definition video wall), which is now the centerpiece of many SPSO exhibits.

From those humble beginnings more than 25 years ago, the SPSO has built a firm foundation of experience in telling the story of NASA to the world and representing NASA and the United States as a world leader in scientific research, exploration, and discovery. The SPSO has a unique infrastructure that allows the office's staff to offer a suite of exhibit-support services including dynamic displays, access to free and accurate communication products, and inspiring experiences to tens of thousands of individuals across the globe.

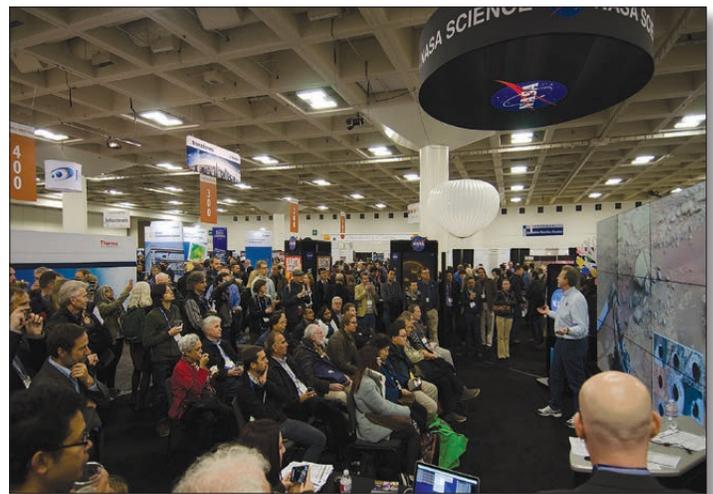
2015: Exhibit at the Fall AGU meeting. The NASA Science booth at AGU always draws a large crowd, as do others around the world, throughout the year.

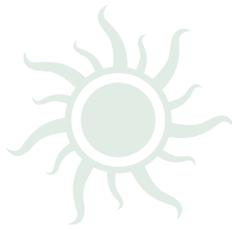


Early 2000s. Early booths featured poster backdrops, computer displays, and many print products for distribution.



2008: Exhibit at the National Academy of Sciences. Exhibit displays have continued to evolve through the years. This was the first use of the pop-up exhibit "skins" shown here.





The Team

The Science Program Support Office staff offers a unique skill set that allows the group to plan, organize, develop, design, and deliver successful execution of small- and large-scale exhibit-support services and the several thousand communication products that have been developed and implemented over the years.



- Winnie Humberson *Team Lead*
- Steven Graham *Technical Lead*
- Alan Ward *Writing/Editing*
- Heather Hanson *Writing/Editing*
- Marit Jentoft-Nilsen *Data Visualization/Multimedia*
- Amy Moran *Data Visualization/Multimedia*
- Mark Malanoski *Exhibit Specialist/Multimedia*
- Ishon Prescott *Exhibit Specialist/Social Media*
- Sally Bensusen *Visual Information/Graphic Design*
- Deborah McLean *Visual Information/Graphic Design*
- Kevin Miller *Visual Information/Graphic Design*
- Cynthia Trapp *Administrative Coordinator*
- Ryan Barker *Logistics Coordinator*



The Earth Observer editorial consultants:

- Mitch Hobish
- Ernest Hilsenrath



Looking Ahead

Upcoming Events

The Science Program Support Office has identified a list of upcoming conferences and events to attend in the 2016–2017 time frame. These include:

- International Balloon Fiesta: October 5–9, 2016
- AAS Division for Planetary Sciences Annual Meeting: October 16–24, 2016
- 22nd Conference of Parties to the United Nations Framework Convention on Climate Change: November 7–18, 2016
- American Geophysical Union Fall Meeting: December 12–16, 2016
- American Astronomical Society Annual Meeting: January 3–7, 2017
- American Meteorological Society Annual Meeting: January 22–26, 2017
- National Conference and Global Forum on Science, Policy and the Environment: January 24–26, 2017
- American Association for the Advancement of Science Annual Meeting: February 16–20, 2017
- National Science Teachers Association National Conference: March 30–April 2, 2017
- American Chemical Society National Meeting & Exposition: April 2–6, 2017
- European Geosciences Union General Assembly: April 23–28, 2017
- Earth Day at Union Station: April 21–22, 2017
- Maryland Library Association Annual Conference: May 3–5, 2017
- Japan Geoscience Union Meeting: May 20–25, 2017
- NASA Science Day on the Hill: June 2017
- Air & Waste Management Association Conference & Exhibition: June 5–8, 2017
- American Library Association Annual Conference: June 2–17, 2017
- National Scout Jamboree: July 19–28, 2017
- International Geoscience and Remote Sensing Symposium: July 23–28, 2017
- 14th Annual Asia Oceania Geosciences Society Annual Meeting: August 6–11, 2017
- Total Solar Eclipse: August 21, 2017
- Association of Science-Technology Centers Annual Conference: October 21–24, 2017
- Our Ocean Conference: 2017

To support these events, a variety of Hyperwall content and printed products will be designed and developed. The office, with help from senior-level management, will recruit several scientists and outreach personnel to present science stories on the Hyperwall. To perform both of these tasks (product development and Hyperwall development), the office will work with their many partners to align their messages with the agency's current efforts.

Long-term Goals

Looking ahead, the Science Program Support Office will continue seeking opportunities to:

- develop and implement next-generation communication platforms—i.e., implement new software capabilities and communication tools;
- highlight new science data and results from the latest missions, research topics, and programs;
- strengthen internal partnerships within NASA to ensure the delivery of the most cohesive, precise, up-to-date messages;
- maintain, strengthen, and reinvigorate existing partnerships (both internal and external) to ensure our delivery of clear information;
- broaden our outreach efforts; and
- connect with new audiences.

Summary



It is imperative that NASA and the United States continue to be represented at a variety of scientific venues as world leaders in and across the fields of Astrophysics, Planetary Science, Heliophysics, and Earth Science. Outreach exhibits allow the agency to represent the breadth and depth of NASA Science (as a whole) in a single setting and promote NASA's distinct roles in studying the global atmosphere, oceans and sea ice, land surfaces, ecosystems, the sun, other planets, the universe, and the interactions among these components.

The Science Program Support Office offers a unique and sustainable suite of NASA-grown exhibit-support services and capabilities.

Currently, the Hyperwall provides a revolutionary platform for NASA to communicate its science face-to-face unlike any other space agency in the world—and, as we move toward the future, the office remains committed to implementing “next-generation” communication platforms as they become available.

The hope is that this office will continue to provide and strengthen visibility for the agency for years to come, inspiring a new generation and representing NASA as the leading research agency of the world.

